Aug. 5, 1958 G. A. SODERBERG 2,845,991

CHAIR CONTROL OR IRON

Filed April 28, 1955 2 Sheets-Sheet 1

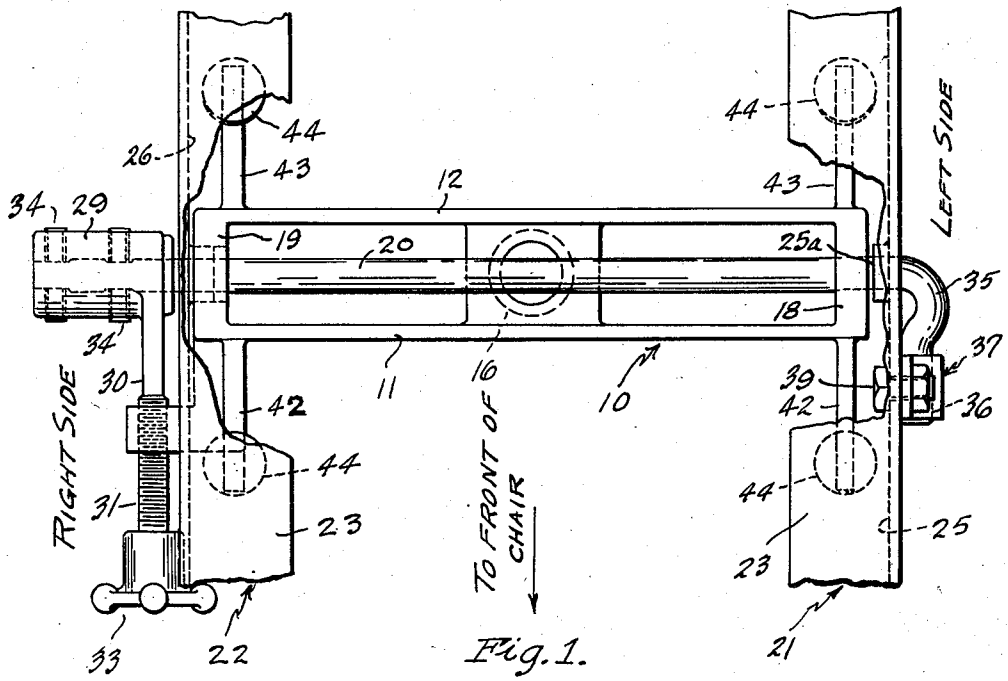

Fig. 1.

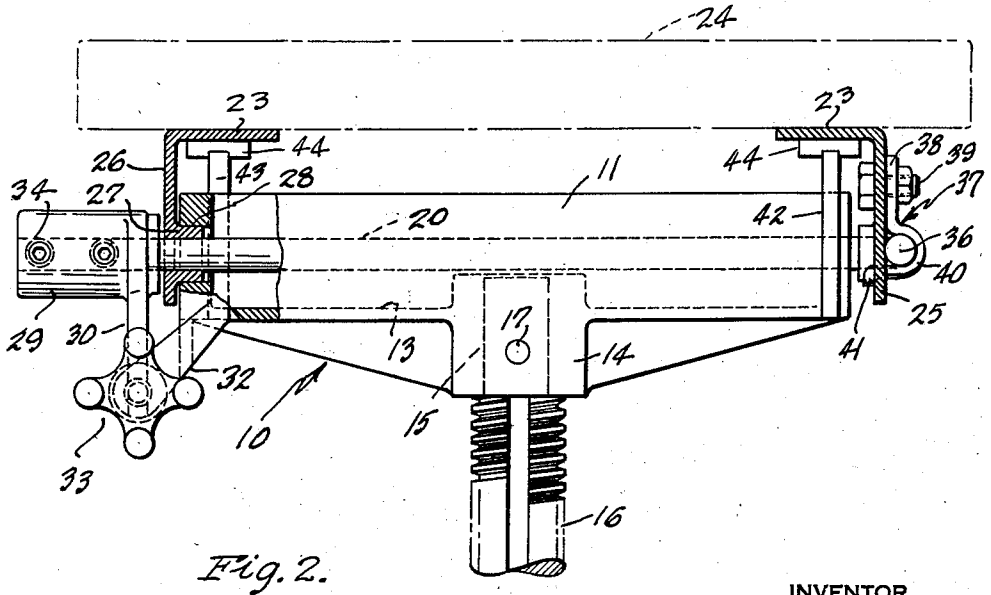

Fig. 2.

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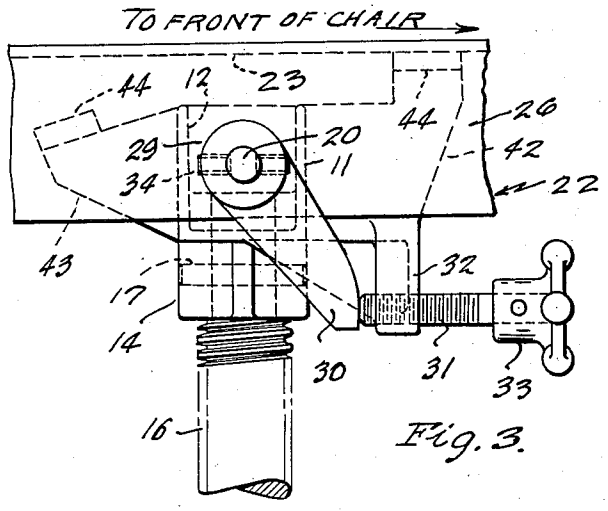

Fig. 3.

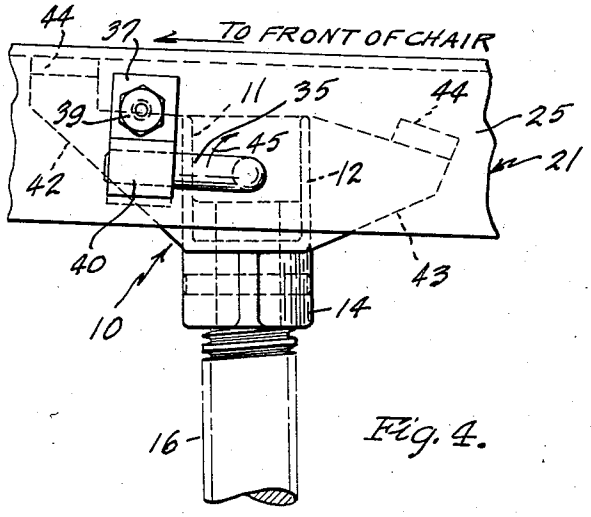

Fig. 4.

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CHAIR CONTROL OR IRON

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3 Claims. (Cl. 155—77)

This invention relates to a chair control or iron for tiltably supporting the seat of an office chair or the like, more particularly swivel chairs and office chairs of so-called arm bucket swivel type, and usually mounted for swivelling movement on a base support; and has for an object to provide an improved chair control wherein a heavy counterbalancing coil spring or springs or rubber cylinders are not needed for supporting and controlling the backward tilting movement.

It is also an object to provide a construction for a chair control or iron in which the control of the rearward tilting movement is effected by torsional movement and stress in a heat-treated alloy steel bar.

Another object is to provide a chair control in which the construction permits use of the resilient action of a torque bar for the tilting support and control, and is such as to provide a uniform torsion action in the tilting operation.

A further object is to provide a chair control which does not require such replaceable parts as springs or rubber cylinders, and in which no heavy hand instrument or hand tool will be required for regulating the tension for control of the rearward movement.

A still further object is to provide a construction in which the torque bar may be so constructed and arranged that it will not materially build up or increase the torsion when the chair seat is tilted backwardly, but which can be of a length and so constructed that it will maintain substantially the same torsion throughout its movement, and therefore will not materially build up or increase its stress by this movement as would coil springs and similar control means. This will also decrease the liability of breakage and greatly increase its life.

With the foregoing and other objects in view, I have devised the construction illustrated in the accompanying drawings forming a part of this specification. It is, however, to be understood the invention is not limited to the specific details of construction and arrangement shown, but may embody various changes and modifications within the scope of the invention.

In these drawings:

Fig. 1 is a top plan view of the chair control or iron with parts broken away to more clearly show the construction;

Fig. 2 is a front view with parts broken away and shown in section;

Fig. 3 is a partial end view looking from the left of Figs. 1 and 2, and

Fig. 4 is a similar partial end view looking from the right of Figs. 1 and 2.

The device comprises an elongated body member **10** of any suitable form, but in the present case of substantially U or channel shape in cross section including upright laterally spaced side walls **11** and **12** and a connecting bottom wall **13**. At the lower part is a hub **14** socketed to receive the reduced upper end **15** of the usual screw post **16** by which the chair seat is supported on the usual base or feet of the chair (not shown). The body may be secured to this post by any suitable means such as the transverse pin **17**.

The body member **10** includes upright cross walls **18** and **19** at its opposite ends, and extending longitudinally of the body between the side walls **11** and **12** and through these end walls is a torque bar or torsion bar **20**, preferably of heat-treated alloy steel so that it has good resilient properties and fatigue resistance. The torsion bar passes through an opening in wall **18** which provides a bearing surface for the bar and permits it to turn therein as the bar is twisted. The chair control also includes two spider arms **21** and **22** mounted at the opposite ends of the body member **10**. These may be of any suitable construction but are preferably arms of angle iron section with upper horizontal flanges **23** which may be secured to the under side of the chair seat **24** by any suitable means, such, for example, as screws (not shown).

The torque bar **20** also extends through the upright flanges **25** and **26** of the spider arms. The flange **26** of the right hand spider arm, which is at the right hand side of the chair when a person is seated in it looking forwardly has a laterally extending boss **27** forming a bearing for the torsion rod **20**, and it also forms a bearing at **28** permitting turning movement in the end wall **19** of the body member. The torque bar extends through this bearing boss **27**, and secured to its outer free end is a torque bar holder **29** having a laterally extending arm **30** engaging the inner free end of an adjusting screw **31** threaded into a laterally extending bracket arm **32** forming a part of the body **10**. Secured to the outer end of this screw is any suitable hand grip means for operating the screw, in this case a ball hand knob **33**. The torque bar holder **29** is secured to the bar by any suitable means, such, for example, as the set screws **34**. At its opposite or left hand end the torque bar passes through the flange **25** of spider arm **21** and the flange may be provided with a boss **25*a*** to increase the length of the bearing. The free end of the bar is bent laterally as indicated at **35**, providing a laterally extending crank arm **36** which is locked to one side of the left hand spider arm **21**. In the arrangement shown the free end of the laterally extending arm **36** lies against the outer side of the upright flange **25** of the spider arm and is securely fastened or locked to this flange by the torque bar lock **37**. In the form shown this comprises a strip of metal having a body portion **38** secured to the flange by the bolt **39**, and includes a loop **40** embracing the free end portion of the arm **36** and having its free end passing through an opening in the flange **25** and bent laterally as shown at **41** to provide a secure grip and hold against the flange to prevent any liability of this securing means or lock becoming loosened or detached.

Projecting forwardly and rearwardly from the body member **10** adjacent its opposite ends and under the spider arms **21** and **22**, are bumper arms **42** and **43** provided with rubber bumpers **44** under the horizontal flanges **23**, and these arms with these bumpers are so located as to permit a limited amount of rearward rocking movement of the spider arms, and to determine the limits of the forward and rearward rocking movements and thus determine the position of the chair seat in both the normal or forward movement and also the rearward rocking movement. Therefore the pads **44** on the rear arms **43** are spaced below the top flanges **23** as shown in Fig. 4 when the chair seat and the arms are in the normal or forward position.

The operation is as follows: The initial tension of the torque bar or torsion bar **20** may be adjusted by means of the adjusting screw **31** operating against the free end

of the arm **30**. By adjusting the screw inwardly the arm **30** is forced backwardly as viewed in Fig. 3 to increase the initial tension on the bar **20**. When the chair seat is tipped backwardly, the spider arms **21** and **22** will be tipped backwardly, the arm **21** being supported by the torque bar and the arm **22** turning about its bearing **28** in the end wall **19**. The right hand end of the torque bar will be held stationary by the adjusting lever **30** and the adjusting screw **31**, but backward movement of the spider arm **21** will swing the free end portion **36** of the torque bar upwardly and backwardly, as indicated by the arrow **45** in Fig. 4. This will place a torque or torsion on the bar **20** which will resist the backward tilting movement of the chair seat, and when the backward tilting pressure is released this torsion and resilient action of the bar will return the chair seat to its forward or normal position. Because in this construction the torque bar can be made of considerable length, and also because in this backward rocking movement its free end arm **36** has relatively small movement, there is no substantial build-up or increase of tension in the bar caused by this backward movement and twisting action on the bar. Thus the resilient action of the bar is substantially uniform throughout the movement of the chair seat, providing easy and uniform action without building up increase resistance or increased tension as is the case in the use of coil springs or rubber cylinders. However, this tension can be easily controlled or adjusted by means of the adjusting screw **31**.

Having thus set forth the nature of my invention, I claim:

1. In a chair control of the character described, an elongated body member having transverse end walls provided with aligned bearings, a longitudinally extending torque bar extending through the bearings in said end walls, supporting means for a chair seat in the form of transversely extending spider arms at the opposite ends of the body mounted to tilt backwardly on the body and comprising angle bars having upright flanges through which the torque bar extends, the flange of one spider arm having a laterally extending bearing boss mounted to turn in the bearing in the adjacent end wall of the body and providing a bearing for the torque bar in which it is free to turn, means securing the adjacent free end of the torque bar to the body to hold it stationary and adjustable to turn the bar in its bearing in the bearing boss in the spider arm, and means locking the other end of the torque bar to the upright flange of the other spider arm to turn with it as this arm is tilted backwardly to place a torsional strain on the torque bar.

2. In a chair control of the character described, an elongated body member, a support for said member, a longitudinally extending torque bar mounted adjacent its opposite ends in the body and free to turn therein, transversely extending spider arms mounted adjacent the opposite ends of the body tiltable rearwardly thereon and adapted to be secured to a chair seat, a control lever secured to one end of the torque bar, a manually operable adjusting screw mounted in the body and engaging said lever to shift it and turn the connected end of the torque bar relative to the body, means locking the other end of the torque bar to the adjacent spider arm to turn with this arm as it is tilted backwardly to place a torsional strain on the torque bar, and means for limiting the tilting movements of the spider arms.

3. In a chair control of the character described, an elongated body member, a support for said member, a longitudinally extending torque bar mounted adjacent its opposite ends and free to turn in the body, transversely extending spider arms mounted adjacent the opposite ends of the body tiltable rearwardly thereon and adapted to be secured to a chair seat, cooperating adjusting means secured to one end of the bar and the body and adjustable to turn said end of the bar relative to the body comprising a laterally extending lever arm secured to the bar and an adjusting screw mounted in the body member and connected with said lever to shift it to preset an initial torque on the bar, a laterally extending arm at the other end of the bar, and means locking said arm to the adjacent spider arm to move therewith and place a torsional strain on the bar by backward tilting movement of the spider arm.

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